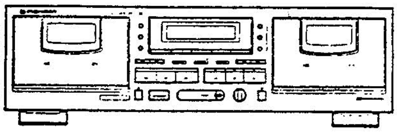
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
ARP2696

STEREO DOUBLE CASSETTE DECK

CT-W502R

CT-W502R HAS THE FOLLOWING:

Type	Power Requirement	Remarks
KUXJ	AC120V only	
KU	AC120V only	
KCXJ	AC120V only	
SD	AC110V, 120 – 127V, 220V, 240V (Switchable)	
SL	AC110V, 120 – 127V, 220V, 240V (Switchable)	

- **This manual is applicable to CT-W502R/KUXJ, KU, KCXJ, SD and SL.**
- **For KU, KCXJ, SD and SL types, refer to page 28.**

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PIONEER ELECTRONIC CORPORATION

1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

NOTICE
(FOR CANADIAN MODEL ONLY)
Fuse symbols ⊣▬⊢ (fast operating fuse) and/or ⊣▬⊠ (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE
(POUR MODELE CANADIEN SEULEMENT)
Les symboles de fusible ⊣▬⊢ (fusible de type rapide) et/ou ⊣▬⊠ (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

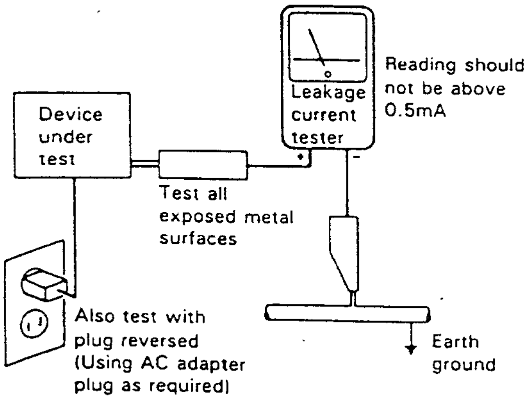
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Leakage current tester
Reading should not be above 0.5mA
Device under test
Test all exposed metal surfaces
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

2. EXPLODED VIEWS, PACKING AND PARTS LIST

2.1 EXTERIOR AND PACKING

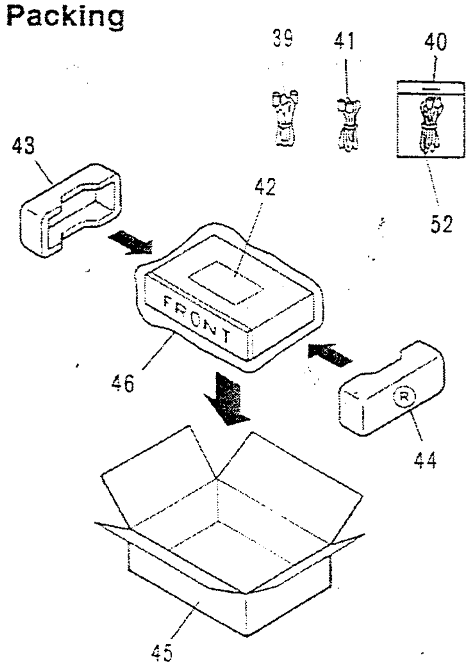
NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

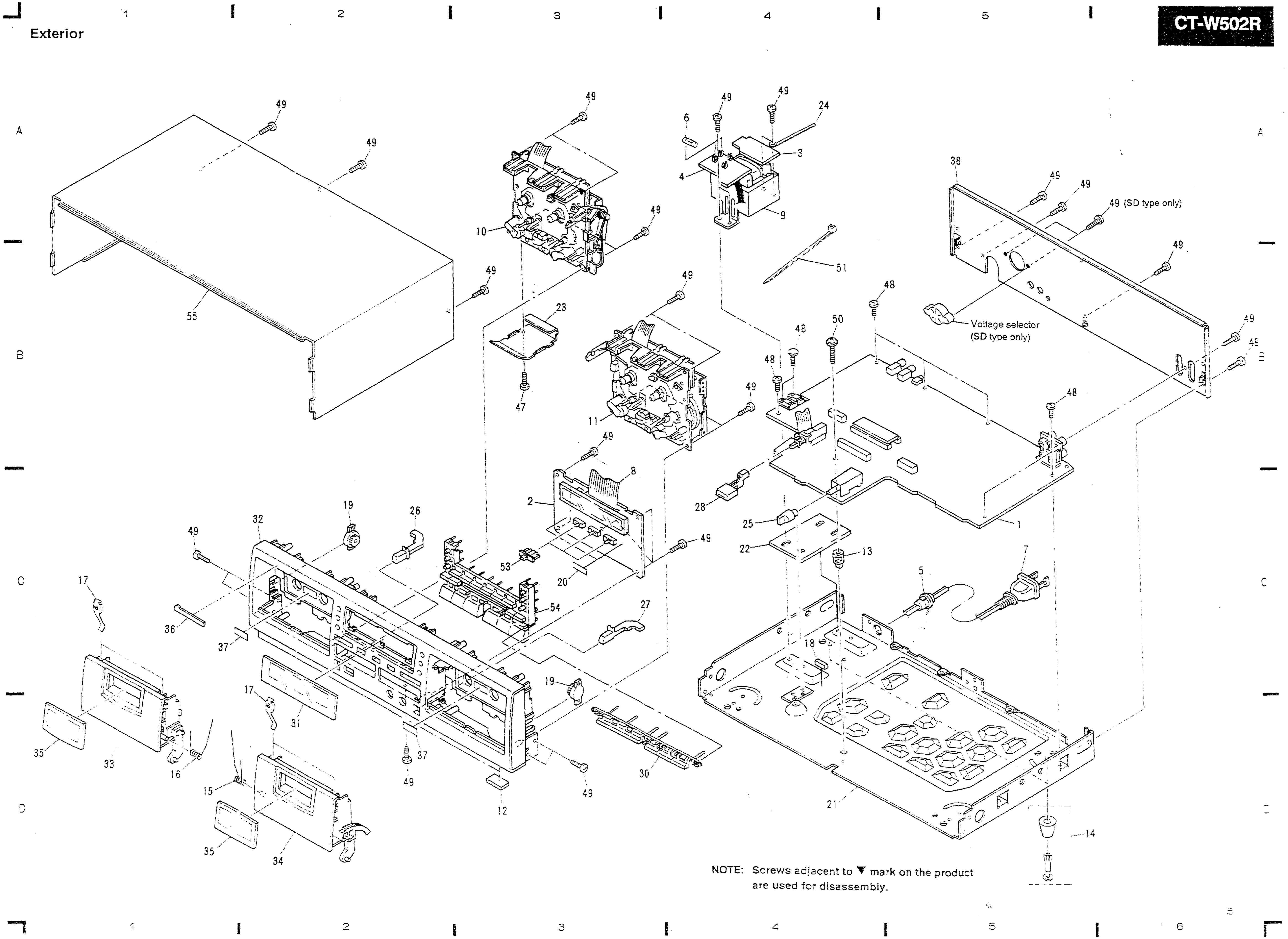
Parts List

Mark	No.	Description	Part No.
	1	Main unit	RWZ2823
	2	Display unit	RWZ2825
NSP	3	Transformer 1 unit	RWZ2941
NSP	4	Transformer 2 unit	RWZ2827
⚠	5	Strain relief	CM – 22C
⚠	6	FU1001, FU1002 Fuse (UL1.5A)	DEK1014
⚠	7	AC power cord	PDG1015
	8	Lead card 35P	RDD1285
⚠	9	Power transformer	RTT1223
⊙	10	Mechanism unit (1, DECK I)	RYM1198
⊙	11	Mechanism unit (2, DECK II)	RYM1199
	12	Rubber sheet	AEB1111
NSP	13	PCB spacer	PNY – 404
	14	Foot assembly	PXA1201
	15	Door spring L	RBH1304
	16	Door spring R	RBH1305
	17	Half pressure spring	RBK1004
NSP	18	FL spacer	REB1171
	19	Damper assembly	REC1005
	20	Knob spacer	REC1195
NSP	21	Main chassis	RNB1091
NSP	22	Transformer shield plate	RNE1451
NSP	23	Mechanism shield plate	RNE1519
	24	Cord clamper	RNH – 184
	25	Balance knob	RAC1705
	26	Eject knob L	RAC1778
	27	Eject knob R	RAC1779
	28	Power knob	RAC1780
	29	......	
	30	REC knob B	RAC1788
	31	FL lens	RAH2179
	32	Front panel	RAH2181
	33	Door pocket L	RAH2183
	34	Door pocket R	RAH2184
	35	Door lens	RAH2187
	36	Name plate	RAM1007
	37	Remain display paper	REE – 113
NSP	38	Rear panel	RNA1702
	39	Connection cord with mini plug (For SR terminal)	PDE – 319
	40	Connection cord assembly	RDE1002
	41	Control cord (For CD DECK SYNCHRO)	RDE1030
	42	Operating instructions (English)	RRB1127
	43	Pad	RHA1115
	44	Pad R	RHA1116
	45	Packing case	RHG1480
	46	Sheet	Z23 – 007
	47	Screw	BBZ20P040FMC
	48	Screw	BBZ30P060FMC
	49	Screw	BBZ30P080FZK
	50	Screw	IBZ30P150FCU
	51	Binder	REC – 371
	52	Connection cord with plug	RDE – 010
	53	Slide knob	REA1078
	54	Control knob	RAC1783
	55	Bonnet	REA1077

Packing



Exterior


1
2
3
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5
6
A
B
C
D
49
55
10
23
47
11
8
2
6
24
3
4
9
51
38
49 (SD type only)
Voltage selector
(SD type only)
48
50
1
28
25
22
13
5
7
32
19
26
17
36
37
53
20
54
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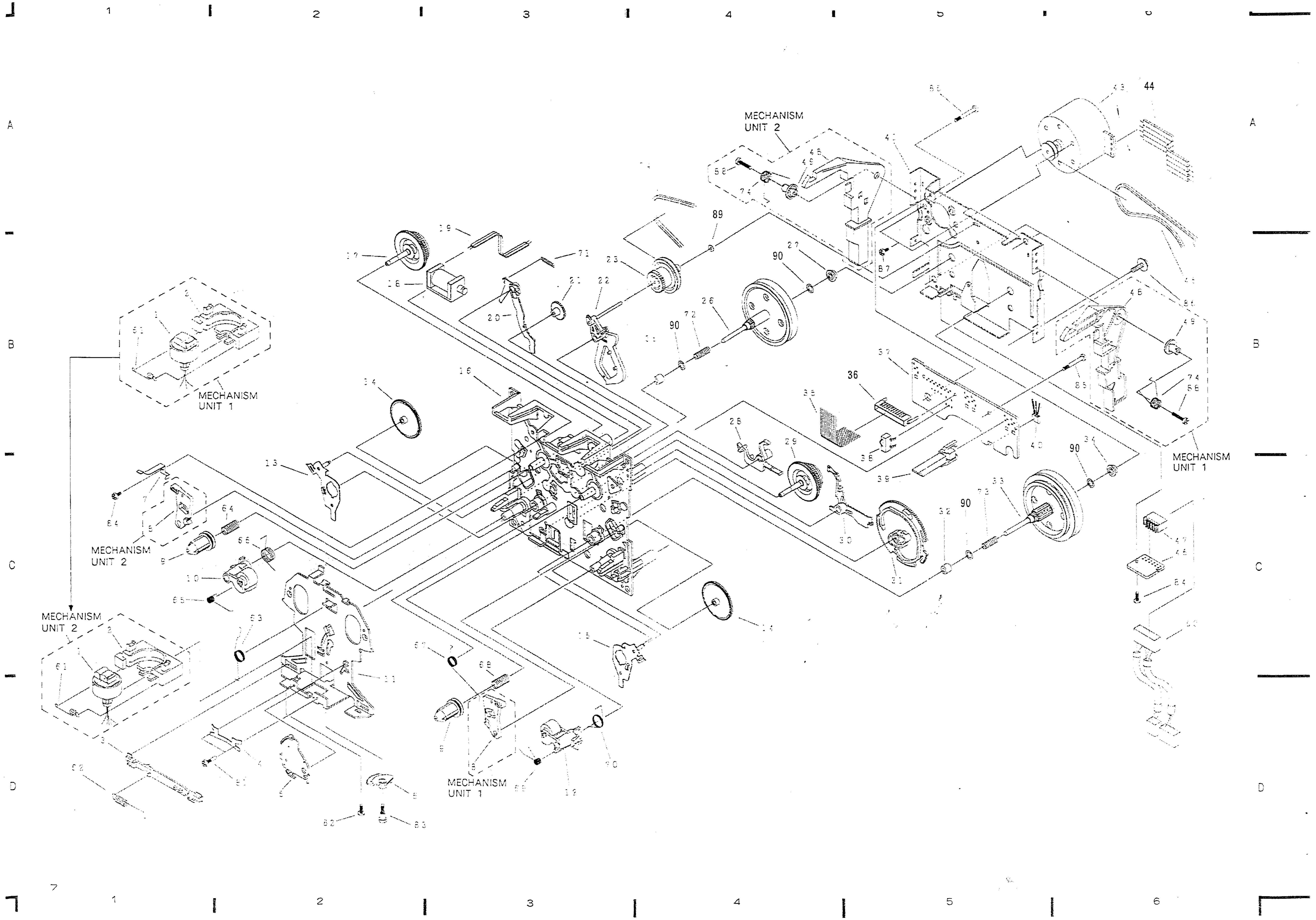
18
21
14

NOTE: Screws adjacent to ▼ mark on the product
are used for disassembly.

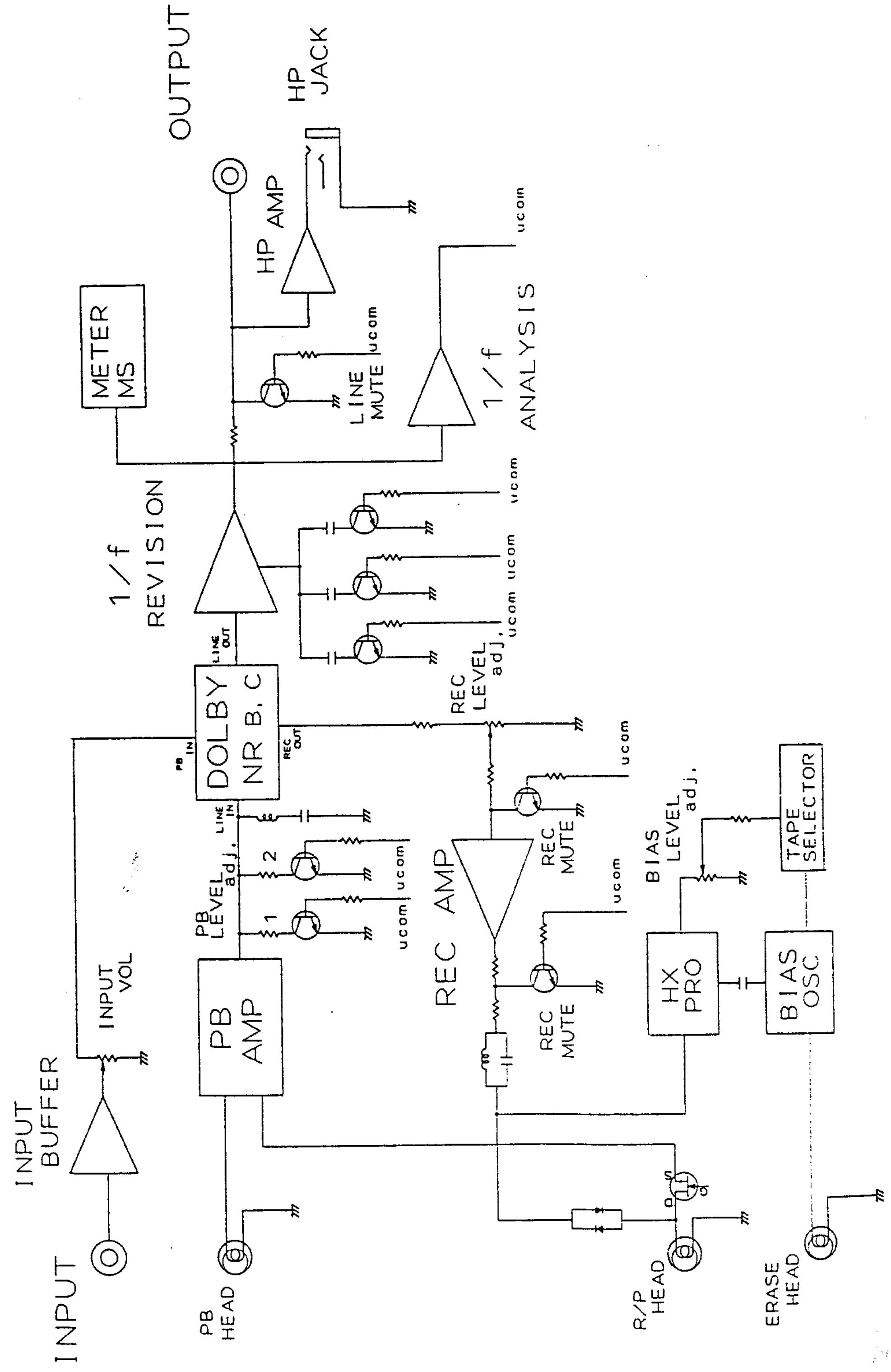
2.2 MECHANISM UNIT 1(RYM1198)
MECHANISM UNIT 2(RYM1199)

Parts List

Mark	No.	Description	Part No.
	1	ASS'Y HOLDER HEAD (Mechanism unit 2) ASS'Y HOLDER HEAD (Mechanism unit 1)	RXA1477 RXA1500
	2	FLAME HEAD	RNK1715
	3	LEVER HEAD	RNK1716
	4	SPRING AZIMUTH	RBK1006
	5	ASS'Y ARM ASSIST	RXA1401
	6	GEAR ARM HEAD	RNK1717
	7	SPRING CASSETTE	RBK1039
	8	EJECT LOCK	RNK1718
	9	CAP REEL	RNK1719
	10	ASS'Y PINCH ARM L	RXA1403
	11	CHASSIS HEAD	RNE1437
	12	ASS'Y PINCH ARM R	RXA1404
	13	ARM PLAY L	RNK1866
	14	GEAR PLAY	RNK1867
	15	ARM PLAY R	RNK1868
	16	CHASSIS OS.	RXA1411
	17	ASS'Y SUB REEL L	RXA1407
⚠	18	SOLENOID	RXP1020
	19	WIRE	RDC1006
	20	ARM RVS	RNK1721
	21	GEAR FF	RNK1723
	22	ASS'Y ARM FR	RXA1412
	23	ASS'Y PULLEY FR	RXA1413
	24	BELT FR	REB1158
	25	METAL	RNG1048
	26	ASS'Y FLYWHEEL L	RXA1423
	27	METAL	RNG1005
	28	ARM BRAKE	RNK1724
	29	ASS'Y SUB REEL R	RXA1408
	30	ARM TRIGGER	RNK1722
	31	GEAR CAM	RNK1725
	32	METAL	RNG1049
	33	ASS'Y FLYWHEEL R	RXA1424
	34	METAL	RNG1004
	35	WIRE (14P) (Mechanism unit 2) WIRE (12P) (Mechanism unit 1)	RDD1217 RDD1249
NSP	36	HOLDER WIRE	RNK1683
	37	P.C. BOARD	RNP1347
	38	SWITCH MODE	RSN1022
	39	SWITCH (LEAF)	RSN1019
	40	HALL IC.	DN6851A
	41	BRACKET FW	RNE1438
	42	......	
	43	ASS'Y MOTOR	RXM1060
NSP	44	WIRE	RDD1012
	45	BELT MAIN	REB1159
	46	P.C. BOARD	RNP1348
	47	HOUSING (Mechanism unit 2) HOUSING (Mechanism unit 1)	RKP1397 RKP1396
	48	EJECT LEVER L (Mechanism unit 2) EJECT LEVER R (Mechanism unit 1)	RNK1831 RNK1811
	49	COLLAR	RNK1704
	50	WIRE HEAD (Mechanism unit 2) WIRE HEAD (Mechanism unit 1)	RKP1399 RKP1398
	61	SPRING	RBH1282
	62	SPRING	RBH1283
	63	SPRING	RBH1284
	64	SPRING	RBH1286
	65	SPRING	RBH1288
	66	SPRING	RBH1291
	67	SPRING	RBH1285
	68	SPRING	RBH1287
	69	SPRING	RBH1289
	70	SPRING	RBH1290
	71	SPRING	RBH1292
	72	SPRING	RBH1061
	73	SPRING	RBH1325
	74	SPRING (L) (Mechanism unit 2) SPRING (R) (Mechanism unit 1)	RBH1319 RBH1320
	81	SCREW	RBA1023
	82	SCREW	RBA1027
	83	SCREW	RBA1030
	84	SCREW	PCZ20P040FMC
	85	SCREW	RBA1093
	86	SCREW	RBA1094
	87	SCREW	RBA1065
	88	SCREW	RBA1095
	89	WASHER	RBF1046
	90	WASHER	WA26D047D013

A
B
C
D
MECHANISM UNIT 2
MECHANISM UNIT 1
MECHANISM UNIT 1
MECHANISM UNIT 2
MECHANISM UNIT 2
MECHANISM UNIT 1
MECHANISM UNIT 1

3. BLOCK DIAGRAM



INPUT
INPUT BUFFER
INPUT VOL
PB HEAD
PB AMP
PB LEVEL adj.
1
2
ucom
ucom
ucom
ucom
LINE IN
PB IN
DOLBY NR B, C
REC OUT
LINE OUT
1/f REVISION
REC LEVEL adj.
ucom
ucom
ucom
METER MS
OUTPUT
HP AMP
HP JACK
LINE MUTE
ucom
1/f ANALYSIS
ucom
REC LEVEL
REC AMP
REC MUTE
REC MUTE
ucom
ucom
BIAS LEVEL adj.
TAPE SELECTOR
HX PRO
BIAS OSC
R/P HEAD
ERASE HEAD

4. PCB PARTS LIST

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 Ω → 56 × 10^1 → 561 ………………………… RD1/8PM$\boxed{5}\boxed{6}\boxed{1}$J
47k Ω → 47 × 10^3 → 473 ………………………… RD1/4PS$\boxed{4}\boxed{7}\boxed{3}$J
0.5 Ω → 0R5 ………………………… RN2H$\boxed{0}\boxed{R}\boxed{5}$K
1 Ω → 010 ………………………… RS1P$\boxed{0}\boxed{1}\boxed{0}$K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10^1 → 5621 ………………………… RN1/4PC$\boxed{5}\boxed{6}\boxed{2}\boxed{1}$F

LIST OF ASSEMBLIES

Mark	No.	Description	Part No.
NSP	MOTHER UNIT		RWM1581
	├ MAIN UNIT		RWZ2823
	├ DISPLAY UNIT		RWZ2825
NSP	├ TRANSFORMER 1 UNIT		RWZ2941
NSP	└ TRANSFORMER 2 UNIT		RWZ2827

MAIN UNIT

SEMICONDUCTORS

Mark	No.	Description	Part No.
	IC201, IC220, IC701, IC902		BA15218
	IC301, IC1601		BA15218N
	IC101		CXA1115BP
	IC251		CXA1330S
⚠	IC1003, IC1004		NJM7812FA
⚠	IC1002		NJM78M05FA
	IC501		PD4442A
	IC1701		TC4050BP
	IC651		UPC1297CA
	IC223		XRA10393
	IC903		XRA10393N
	Q802, Q808, Q809, Q852, Q858, Q1005, Q1010		2SA1309A
⚠	Q1001		2SB1041
	Q460, Q804, Q854		2SB1238X
	Q456-Q458		2SC1815
	Q163, Q164, Q459, Q1006, Q1007		2SC3311A
	Q807, Q857		2SD1858X
	Q309-Q312, Q701, Q702		2SD2144S
	Q161, Q162		2SK373
	Q165, Q652		DTA114ES
	Q508, Q751		DTA114TS
	Q108, Q454, Q455, Q904		DTC114TS
	Q101-Q106, Q109, Q167, Q201-Q206, Q256, Q301-Q308, Q313, Q503-Q507, Q511, Q512, Q653, Q803, Q805, Q853, Q855, Q903		DTC124ES
⚠	D1001		1SR35-100A
⚠	D1006		1SR35-100AVL
	D452, D801, D812		1SS252
	D161-D166, D221, D251, D454, D455, D503-D506, D508, D509, D514, D515, D517, D518, D520, D521, D752, D802, D805-D811, D813-D818, D901-D903, D1011, D1300-D1305, D1701-D1705		1SS254
⚠	D1009, D1010,		1SS254
⚠	D1002		MTZJ22A
	D1004		MTZJ3. 3B
	D753		MTZJ3. 9B
	D1003		MTZJ5. 1B
	D501		MTZJ9. 1A
⚠	D1012		S2VB20

SWITCHES

Mark	No.	Description	Part No.
⚠	S1201		RSA1002

COILS AND FILTERS

Mark	No.	Description	Part No.
	L451		LFA121K
	L651, L652	(L=4. 6MHz, Q=25, F=105KHz)	RTD1046
	L452	(F=105K)	RTD1062
	L101, L102	(L=562J)	RTF1099
	L301, L302	(L=103J)	RTF1102
	L303, L304	(L=123J)	RTF1124
	F251, F252		RTF1208

CAPACITORS

Mark	No.	Description	Part No.
	C659, C660		CCCSL101K500
	C161, C162		CCPUSL100J50
	C107-C110		CEANL100M16
	C111, C112		CEANL101M10
	C211-C213, C251-C254, C322, C325, C326, C703, C704		CEAS010M50
	C209, C210, C269, C281-C284, C317, C318, C667, C707, C708, C1016		CEAS100M50
	C291, C1603, C1604		CEAS101M16
	C1010		CEAS102M10
	C1018		CEAS220M50
	C1001		CEAS221M50
	C285, C286, C451, C458		CEAS330M16
	C914, C1004		CEAS330M35
	C913, C1013, C1015, C1605		CEAS331M16
	C915, C916		CEAS3R3M50
	C141, C142, C201, C202, C214, C321, C323, C459, C513, C705, C713, C1024		CEAS470M16
	C1007		CEAS472M16
	C1011		CEAS472M25
	C117, C118, C215, C216, C313, C314		CEAS4R7M50
	C265, C266, C275, C315, C316, C664, C917, C918, C1601, C1602		CEASR22M50
	C267, C268, C273, C274		CEASR33M50
	C233		CEASR47M50
	C293, C294		CFTXA103J50
	C203, C204		CFTXA152J50
	C261-C264		CFTXA222J50
	C191, C192, C454		CFTXA223J50
	C205, C206		CFTXA272J50
	C311, C312		CFTXA472J50
	C207, C208		CFTXA562J50
	C113, C114		CFTXA822J50
	C515		CGCYF104Z25
	C651, C652		CGCYX103K25
	C305, C306		CGCYX123K25
	C307, C308		CGCYX153K25
	C655, C656		CGCYX223K25
	C309, C310		CGCYX272K25
	C225, C227, C319, C320, C455-C457		CGCYX332K25
	C236, C657, C658		CGCYX473K25
	C303, C304		CGCYX562K25
	C750, C751		CGCYX822K25
	C509, C510, C514, C1300, C1302		CKCYF103Z50
	C126, C139, C706, C709, C756, C911, C921, C1008, C1020-C1022, C1030, C1201-C1204, C1301, C1701, C2020		CKCYF473Z50
	C135-C138, C221, C663, C701, C702, C711, C712, C723, C724		CKPUYB101K50
	C105, C106		CKPUYB102K50
	C301, C302		CKPUYB221K50
	C103, C104, C217, C218		CKPUYB271K50
	C123, C124		CKPUYB391K50
	C121, C122		CKPUYB471K50
	C101, C102, C133, C134, C801, C851		CKPUYB681K50
	C653, C654, C923, C924		CKPUYB821K50
	C453		CQPA752J100
	C661, C662	(C=430P, V(DC)= 500)	RCG1005

RESISTORS

Mark	No.	Description	Part No.
	R518	(68k)	RA11T683J
	R528	(10k)	RA4S103J
	R510	(22k)	RA4S223J
	R501	(47k)	RA4S473J
	R1701	(22k)	RA5T223J
	R512	(68k)	RA6T683J
	R341, R342	(560Ω)	RCN1024
	R1702	(11K/22K)	RCX1020
	R451		RD1/2LF010J
	R468		RD1/2LF100J
	R461		RD1/2LF680J
	R1001		RD1/2PMF152J
⚠	R1020	(47Ω)	RFA1/4L470J
	R1609	(220Ω)	RS2LMF221J
	R1002	(470Ω)	RS2LMF471J
	VR851	(10k)	RCP1045
	VR101-VR104, VR301, VR302, VR651, VR652	(22k)	RCP1046
	VR802, VR852	(15k)	RCP1090
	VR2002	(5kA)	RCV1089
	OTHER RESISTORS		RD1/6PM☐☐☐J

OTHERS

Mark	No.	Description	Part No.
	CN1503	CONNECTOR(35P)	52045-3545
	CN801	CONNECTOR(12P)	KPE12
	CN851	CONNECTOR(14P)	KPE14
	JA1300	MAIN JACK	PKN1005
	JA701	PIN JACK(4P)	RKB-020
	JA2003	HEADPHONE JACK	RKN1002
	JA1301, JA1302	REMOTE CONTROL JACK	RKN1004
	X501	CERAMIC RESONATOR(4. 19MHZ)	VSS1014

DISPLAY UNIT

SEMICONDUCTORS

Mark	No.	Description	Part No.
	Q1501		DTA114TS
	D1501-D1509, D1512-D1514		1SS254

SWITCHES

Mark	No.	Description	Part No.
	S1501-S1504, S1506, S1509-S1525		RSG1034
	S1528-S1530		RSH1041

RESISTORS

Mark	No.	Description	Part No.
	ALL RESISTORS		RD1/6PM☐☐☐J

OTHERS

Mark	No.	Description	Part No.
	CN1501	CONNECTOR(35P)	9603S-35F
	V1501	FL INDICATOR TUBE	RAW1123

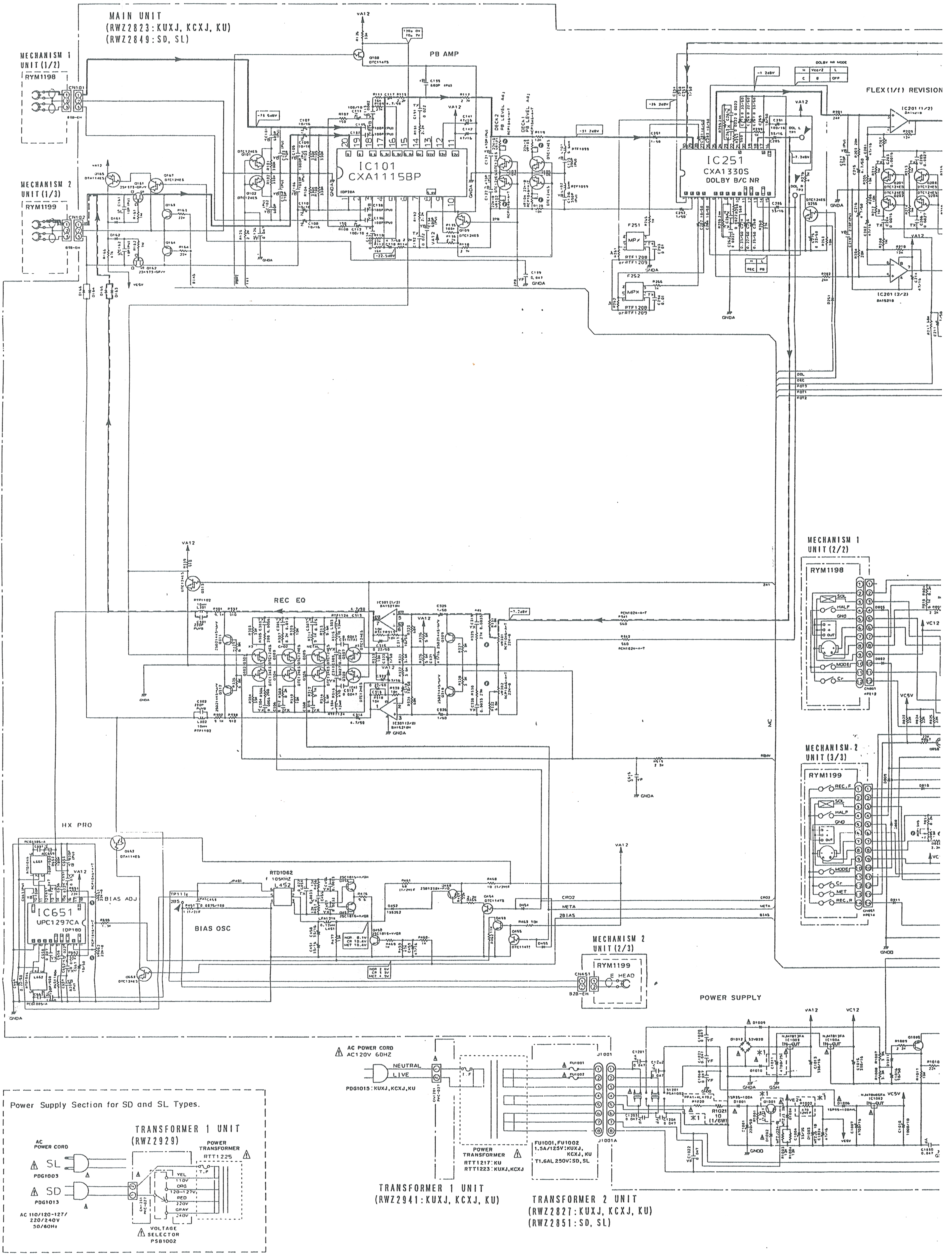
TRANSFORMER 1 UNIT

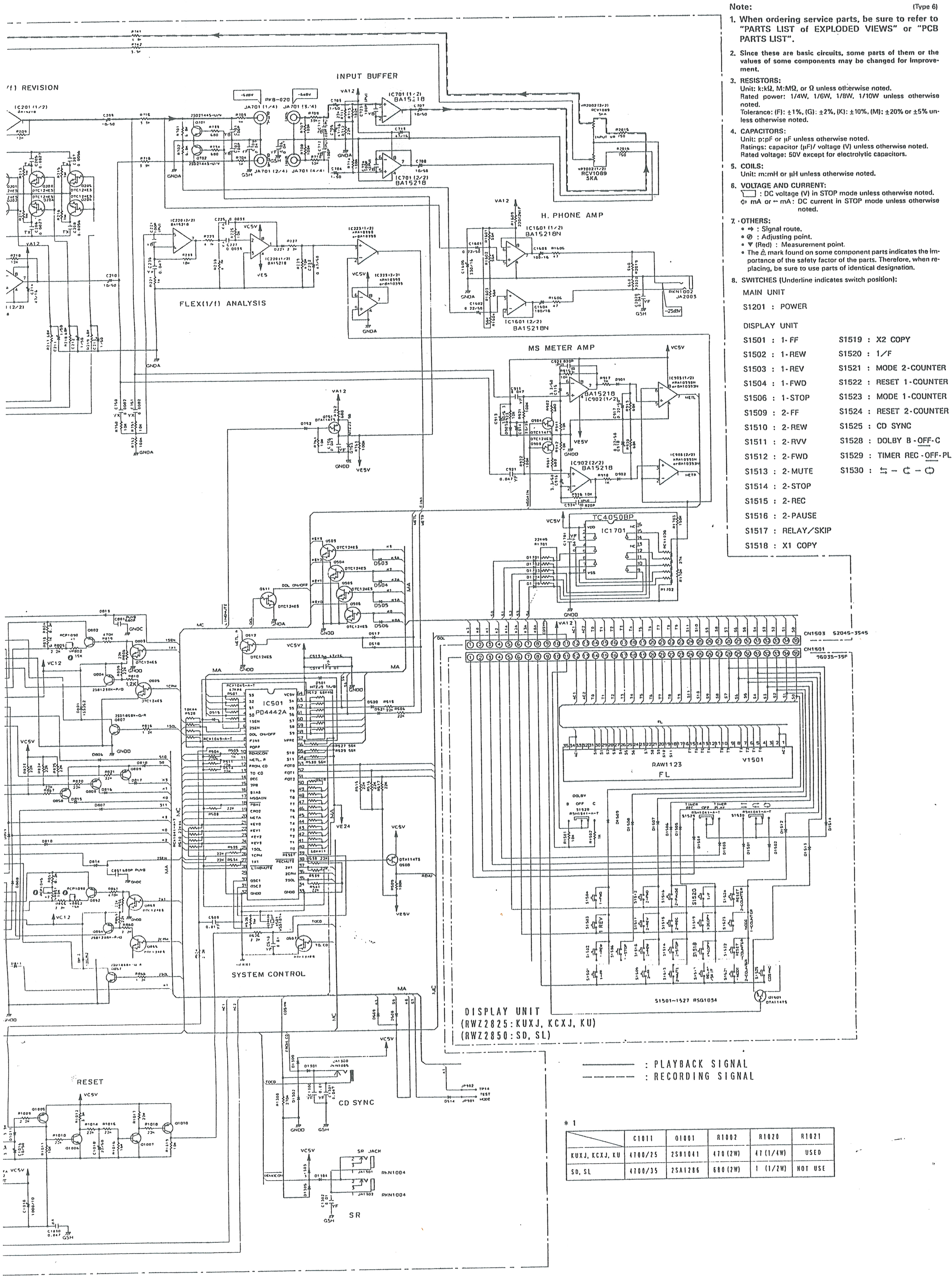
TRANSFORMER 1 unit has no service part.

TRANSFORMER 2 UNIT

TRANSFORMER 2 unit has no service part.

5. SCHEMATIC DIAGRAM


MAIN UNIT
(RWZ2823:KUXJ, KCXJ, KU)
(RWZ2849:SD, SL)
MECHANISM 1 UNIT (1/2)
RYM1198
CN101
MECHANISM 2 UNIT (1/3)
RYM1199
CN102
PB AMP
IC101
CXA1115BP
IC251
CXA1330S
DOLBY B/C NR
DOLBY NR MODE
FLEX (1/1) REVISION
IC201 (1/2)
IC201 (2/2)
DECK2 PB LEVEL Adj
DECK1 PB LEVEL Adj
F251
MPX
F252
REC EQ
IC301 (1/2)
IC301 (2/2)
GNDA
VA12
HX PRO
IC651
UPC1297CA
BIAS ADJ
BIAS OSC
RTD1062
105KHZ
L452
CRO2
META
2BIAS
MECHANISM 2 UNIT (2/3)
RYM1199
E HEAD
CN451
MECHANISM 1 UNIT (2/2)
RYM1198
SOL
HALF
GND
MODE
Cr
MECHANISM 2 UNIT (3/3)
RYM1199
REC.F
SOL
HALF
GND
MODE
Cr
MET
REC.R
VC12
VC5V
POWER SUPPLY
AC POWER CORD
AC120V 60HZ
NEUTRAL
LIVE
PDG1015:KUXJ,KCXJ,KU
POWER TRANSFORMER
RTT1217:KU
RTT1223:KUXJ,KCXJ
FU1001,FU1002
1.5A/125V:KUXJ, KCXJ,KU
T1.6AL 250V:SD,SL
J1001
J1001A
TRANSFORMER 1 UNIT
(RWZ2941:KUXJ, KCXJ, KU)
TRANSFORMER 2 UNIT
(RWZ2827:KUXJ, KCXJ, KU)
(RWZ2851:SD, SL)
Power Supply Section for SD and SL Types.
TRANSFORMER 1 UNIT
(RWZ2929)
AC POWER CORD
SL
PDG1003
SD
PDG1013
AC 110/120-127/220/240V 50/60Hz
POWER TRANSFORMER
RTT1225
YEL
110V
ORG
120-127V
RED
220V
GRAY
240V
VOLTAGE SELECTOR
PSB1002
1
2
3
4
5


6
7
8
9
B
C
D
E
F
5
(f) REVISION
INPUT BUFFER
IC701 (1/2) BA15218
IC701 (2/2) BA15218
RCV1089 5KA
H. PHONE AMP
IC1601 (1/2) BA15218N
IC1601 (2/2) BA15218N
FLEX(1/f) ANALYSIS
MS METER AMP
IC902 (1/2) BA15218
IC902 (2/2) BA15218
TC4050BP
IC1701
IC501
PD4442A
SYSTEM CONTROL
CN1503 52045-3545
CN1501 96035-35F
RAW1123
FL
V1501
S1501~1527 RSG1034
DISPLAY UNIT
(RWZ2825: KUXJ, KCXJ, KU)
(RWZ2850: SD, SL)
RESET
CD SYNC
SR JACK
SR

Note: (Type 6)

1. When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".

2. Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.

3. RESISTORS:
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.

4. CAPACITORS:
   Unit: p:pF or μF unless otherwise noted.
   Ratings: capacitor (μF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.

5. COILS:
   Unit: m:mH or μH unless otherwise noted.

6. VOLTAGE AND CURRENT:
   ▭ : DC voltage (V) in STOP mode unless otherwise noted.
   ⇦ mA or ← mA: DC current in STOP mode unless otherwise noted.

7. OTHERS:
   - ➡ : Signal route.
   - ⊘ : Adjusting point.
   - ▼ (Red) : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.

8. SWITCHES (Underline indicates switch position):

MAIN UNIT

S1201 : POWER

DISPLAY UNIT

S1501 : 1-FF
S1502 : 1-REW
S1503 : 1-REV
S1504 : 1-FWD
S1506 : 1-STOP
S1509 : 2-FF
S1510 : 2-REW
S1511 : 2-RVV
S1512 : 2-FWD
S1513 : 2-MUTE
S1514 : 2-STOP
S1515 : 2-REC
S1516 : 2-PAUSE
S1517 : RELAY/SKIP
S1518 : X1 COPY

S1519 : X2 COPY
S1520 : 1/F
S1521 : MODE 2-COUNTER
S1522 : RESET 1-COUNTER
S1523 : MODE 1-COUNTER
S1524 : RESET 2-COUNTER
S1525 : CD SYNC
S1528 : DOLBY B-OFF-C
S1529 : TIMER REC-OFF-PLAY
S1530 : ⇆ – ⊂ – ⊃

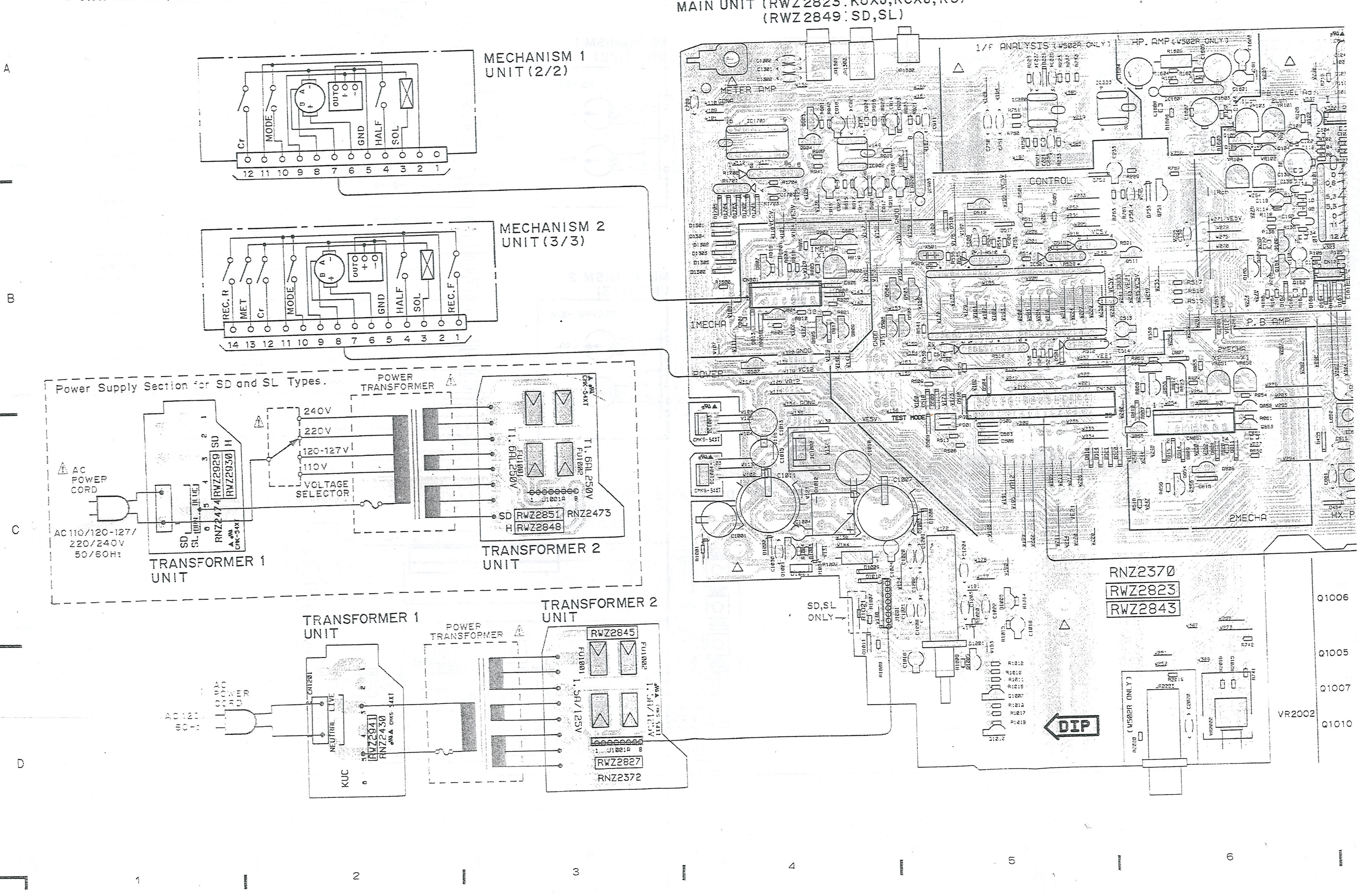
———— : PLAYBACK SIGNAL
– – – – : RECORDING SIGNAL

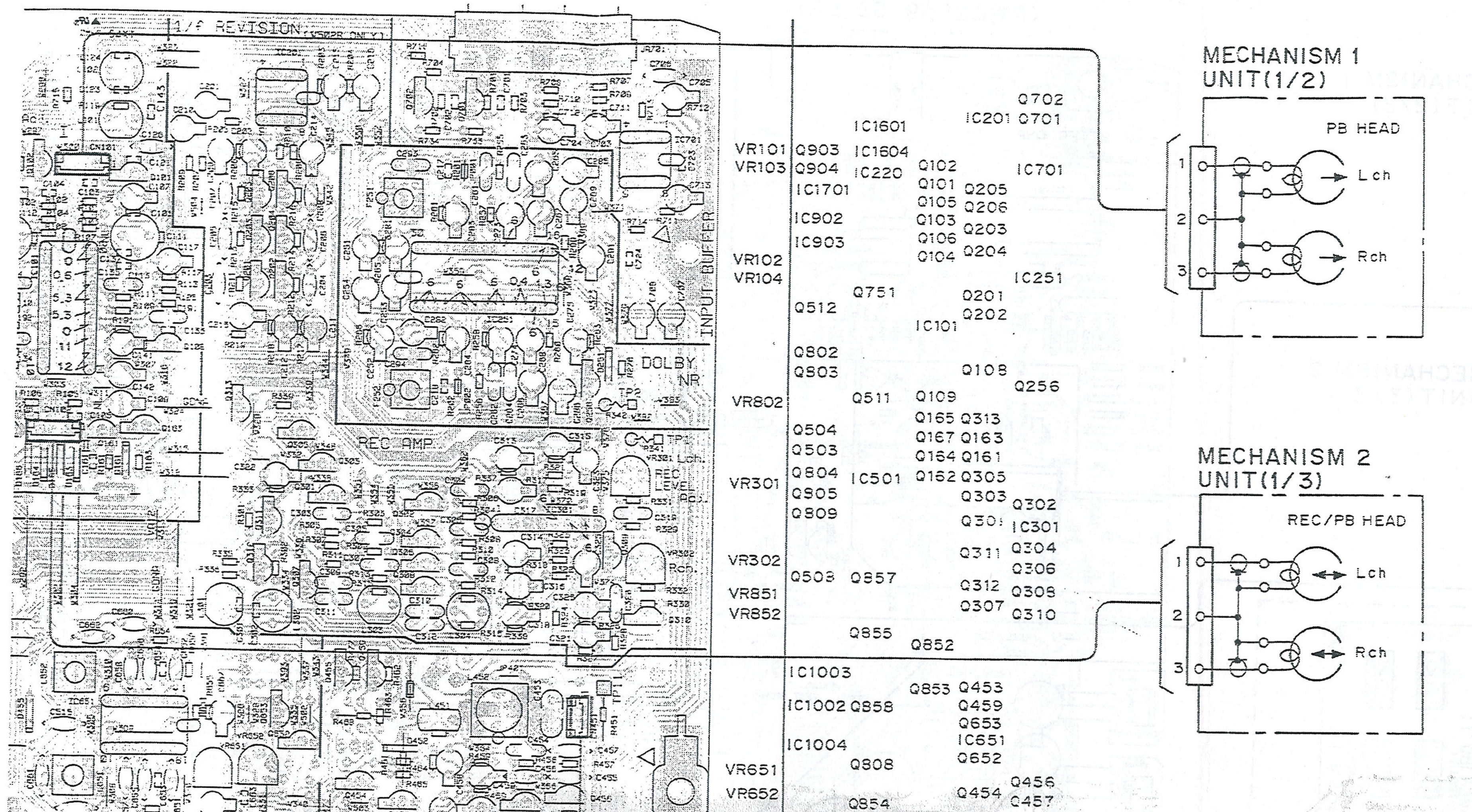
＊1

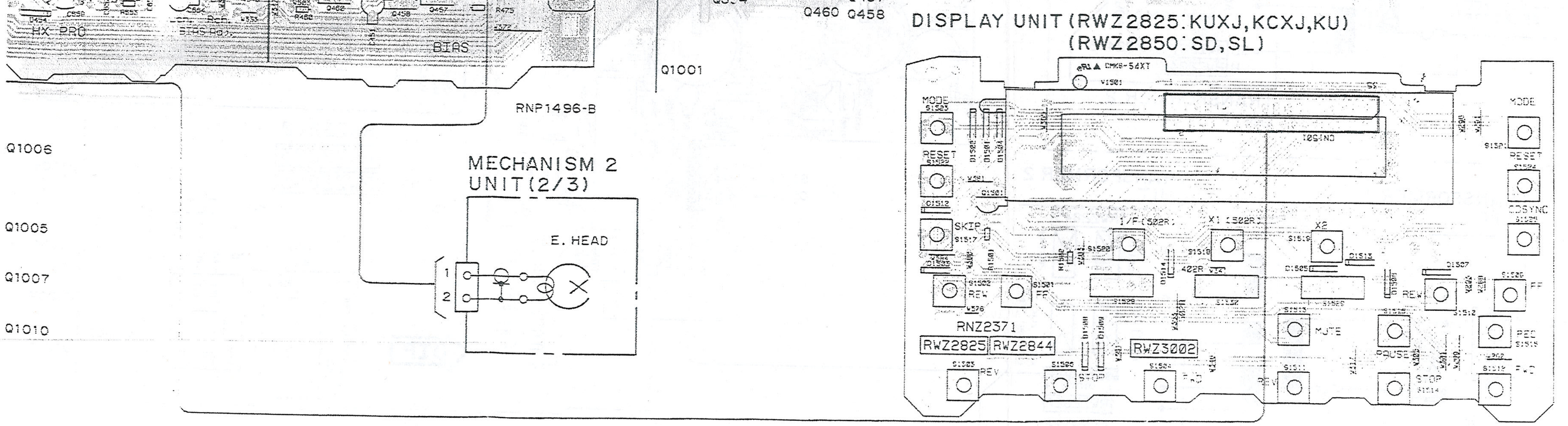
	C1011	Q1001	R1002	R1020	R1021
KUXJ, KCXJ, KU	4700/25	2SB1041	470 (2W)	47 (1/4W)	USED
SD, SL	4700/35	2SA1286	680 (2W)	1 (1/2W)	NOT USE

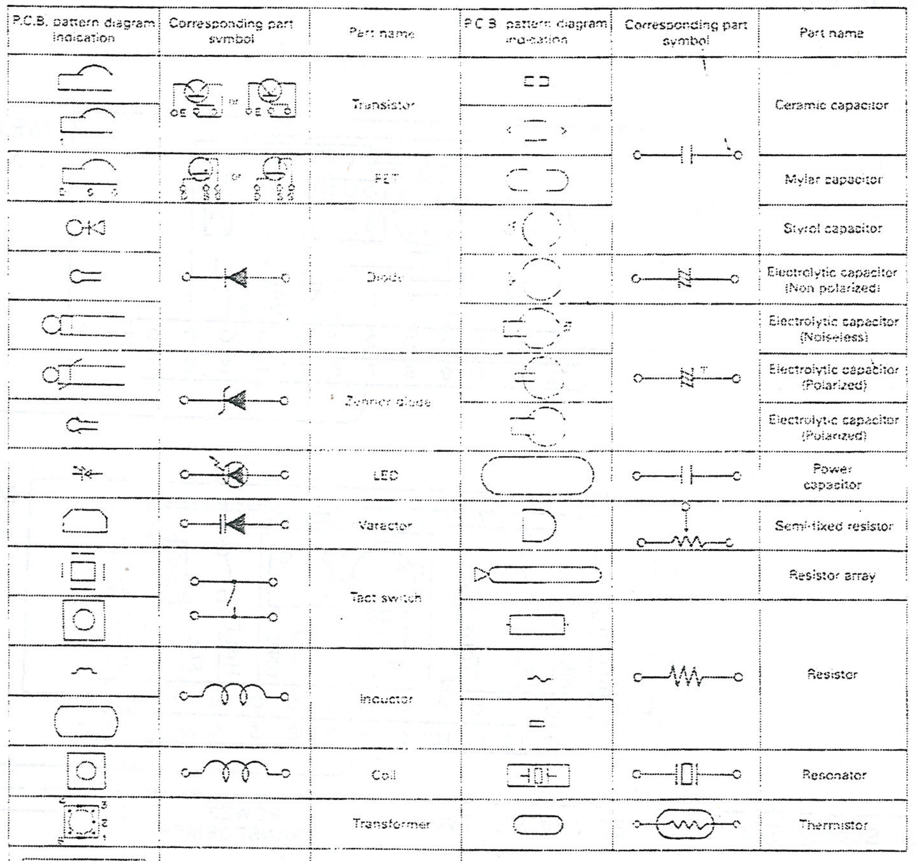
6. PCB CONNECTION DIAGRAM

- View from component side


MAIN UNIT (RWZ2823: KUXJ,KCXJ,KU)
(RWZ2849: SD,SL)
MECHANISM 1 UNIT (2/2)
Cr
MODE
GND
HALF
SOL
12 11 10 9 8 7 6 5 4 3 2 1
MECHANISM 2 UNIT (3/3)
REC.R
MET
Cr
MODE
GND
HALF
SOL
REC.F
14 13 12 11 10 9 8 7 6 5 4 3 2 1
Power Supply Section for SD and SL Types.
POWER TRANSFORMER
240V
220V
120-127V
110V
VOLTAGE SELECTOR
AC POWER CORD
AC110/120-127/220/240V 50/60Hz
RWZ2929 SD
RWZ2930 H
RNZ2474
CMK-54XT
TRANSFORMER 1 UNIT
T1.6AL250V
FU1001
FU1002
J1001A
SD RWZ2851
H RWZ2848
RNZ2473
TRANSFORMER 2 UNIT
TRANSFORMER 1 UNIT
POWER TRANSFORMER
TRANSFORMER 2 UNIT
RWZ2845
AC POWER CORD
AC120 50-60
CN1201
NEUTRAL
LIVE
RWZ2941
RNZ2430
CMKS-54XT
KUC
1.5A/125V
J1001A
RWZ2827
RNZ2372
METER AMP
1/f ANALYSIS (W502R ONLY)
HP. AMP (W502R ONLY)
LEVEL
CONTROL
1MECHA
MECHA
POWER
TEST MODE
P.B AMP
2MECHA
HX-P
SD,SL ONLY
DIP
(W502R ONLY)
RNZ2370
RWZ2823
RWZ2843
Q1006
Q1005
Q1007
VR2002
Q1010
A
B
C
D
1
2
3
4
5
6


1/f REVISION (W502R ONLY)
INPUT BUFFER
DOLBY NR
REC AMP
REC LEVEL ADJ.
HX PRO
BIAS
VR101 VR103
Q903 Q904
IC1601 IC1604 IC220
IC1701
IC902 IC903
VR102 VR104
Q512
Q751
IC201 Q702 Q701
Q102 Q101 Q105 Q103 Q106 Q104
Q205 Q206 Q203 Q204
IC701
IC251
Q201 Q202
IC101
Q802 Q803
VR802
Q511
Q108
Q256
Q109 Q165 Q167 Q164 Q162
Q313 Q163 Q161 Q305
Q504 Q503 Q804 Q905 Q809
VR301
IC501
Q303 Q301 Q311 Q312 Q307
Q302 IC301 Q304 Q306 Q308 Q310
VR302
Q508 Q857
VR851 VR852
Q855 Q852
IC1003 IC1002 IC1004
Q858 Q853
Q453 Q459 Q653 IC651 Q652
Q808
VR651 VR652
Q854
Q454 Q460
Q456 Q457 Q458
MECHANISM 1 UNIT(1/2)
PB HEAD
Lch
Rch
1
2
3
MECHANISM 2 UNIT(1/3)
REC/PB HEAD
Lch
Rch
1
2
3


Q1001
RNP1496-B
Q1006
Q1005
Q1007
Q1010
MECHANISM 2 UNIT(2/3)
E. HEAD
1
2
DISPLAY UNIT (RWZ2825: KUXJ, KCXJ, KU)
(RWZ2850: SD, SL)
MODE
RESET
SKIP
1/F (502R)
X1 (502R)
X2
REW
FF
MUTE
PAUSE
REC
STOP
P.D
CDSYNC
RNZ2371
RWZ2825
RWZ2844
RWZ3002



P.C.B. pattern diagram indication	Corresponding part symbol	Part name	P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			Ceramic capacitor
		FET			Mylar capacitor
					Styrol capacitor
		Diode			Electrolytic capacitor (Non polarized)
					Electrolytic capacitor (Noiseless)
		Zenner diode			Electrolytic capacitor (Polarized)
					Electrolytic capacitor (Polarized)
		LED			Power capacitor
		Varactor			Semi-fixed resistor
		Tact switch			Resistor array
		Inductor			Resistor
		Coil			Resonator
		Transformer			Thermistor
		Filter			

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

7. ADJUSTMENTS

7.1 MECHANICAL ADJUSTMENT

7.1.1 Door Damping Check and Adjustment

Set the door spring of the DECK I side to position (A) as shown in Fig. 7-1 Then, erect the front panel assembly vertically.
Open the doors of DECK I and DECK II at the same time. At this point, confirm that the difference between the door completely opened and the other door is within 15mm. If this standard is not satisfied install the door spring of DECK I at another position and adjust as follows:

- When the door of DECK I opens later than that of DECK II : Change the door spring of DECK II from A to B.
- When the door of DECK I opens faster than that of DECK II : Change the door spring of DECK I from A to B.

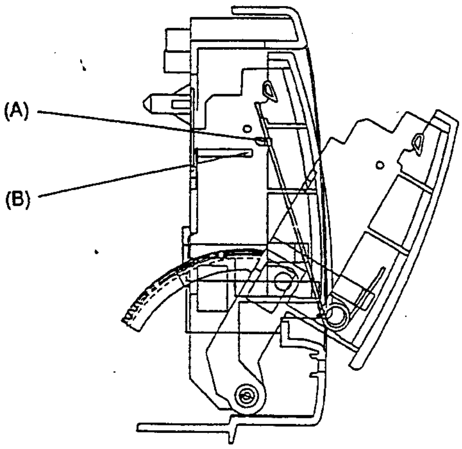


Fig. 7–1

7.1.2 Tape Speed

- Perform this adjustment in the test mode.
- TEST mode setting.

1. Set the REV MODE to "⇄".
2. Short-circuit the JP901 and JP902 for a moment. (Set into TEST mode.)
3. The speed becomes normal when the PLAY key is pressed, and double when the FF key is pressed.
4. To cancel the TEST mode, press the DECK I COUNTER RESET key or turn off the power.

1. Tape Speed Adjustment and Check						
No.	Deck	Mode	Test tape	Adjusting points	Specifications/Ratings (playback frequency)	Remarks
1	I	Double speed PLAY	STD-301 (3 kHz)	check	6000 Hz ± 600 Hz	
2	II			VR851	Within ± 10 Hz against the measurement value of the step 1 (deck I)	
3	I	NORMAL speed PLAY		VR802	3000 Hz ± 5 Hz	
4	II			VR852	Within ± 5 Hz against the measurement value of the step 3 (deck I)	

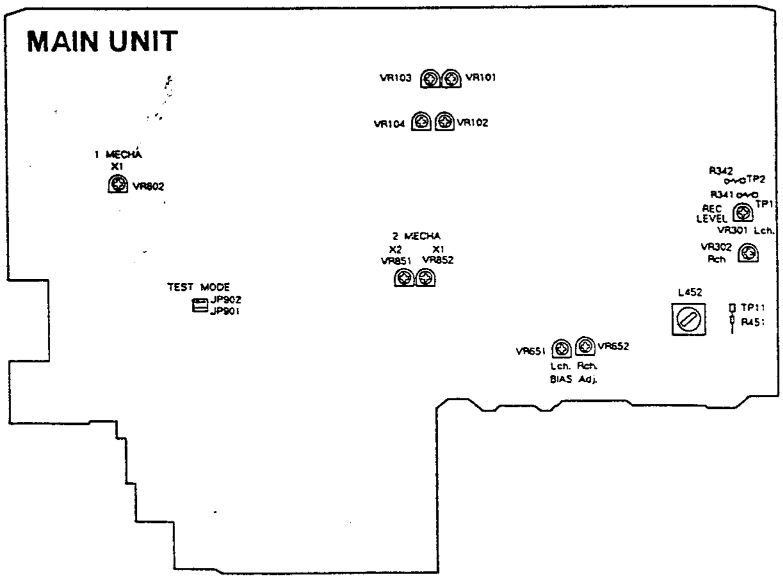

MAIN UNIT
VR103
VR101
VR104
VR102
1 MECHA
X1
VR802
R342
TP2
R341
REC LEVEL
TP1
VR301 Lch.
VR302 Rch
2 MECHA
X2
X1
VR851
VR852
TEST MODE
JP902
JP901
L452
TP11
R451
VR651
VR652
Lch. Rch.
BIAS Adj.

Fig. 7–2 Adjusting points

7.2 ELECTRICAL ADJUSTMENTS

Adjustment Conditions

1. The mechanical adjustments must be completed first.
2. The head must be cleaned and demagnetized.
3. Turn power on allow the deck to warm up for at least a few minutes before commencing any electrical adjustments.
4. The reference signal is 0 dBV=1 Vrms.
5. Connect a 50 kΩ (or between 47k to 52 kΩ) load resistance to the OUTPUT terminals.
6. Unless otherwise specified. the switches listed below are left in the positions indicated.
   DOLBY NR : OFF
   TAPE SELECTOR : NORM

Test Tapes

STD–331E	: Playback adjustments (See Fig. 7–3)
STD–631	: NORMAL blank tape
STD–621	: CrO2 blank tape
STD–610	: METAL blank tape

*As the reference recording level is 250 nwb/m for STD–331E, the recording level will be higher by 4 dB for STD–331B (160 nwb/m). When adjusting, pay carefull attention to the type of tape used.

List of Adjustments

Playback sections

1. Head azimuth adjustment.
2. Playback level adjustment.

Recording sections

1. Bias oscillator adjustment.
2. Recording bias adjustment.
3. Recording level adjustment.
4. Level meter check.

NOTE: This unit has an automatic tape selection feature.

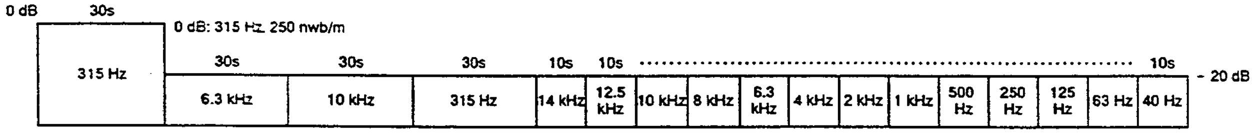
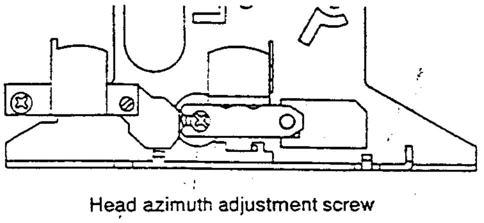

0 dB
30s
315 Hz
0 dB: 315 Hz 250 nwb/m
30s
30s
30s
10s
10s
10s
6.3 kHz
10 kHz
315 Hz
14 kHz
12.5 kHz
10 kHz
8 kHz
6.3 kHz
4 kHz
2 kHz
1 kHz
500 Hz
250 Hz
125 Hz
63 Hz
40 Hz
- 20 dB

Fig. 7–3 Constants of the test tape STD–331E

DECK I


Head azimuth adjustment screw

DECK II

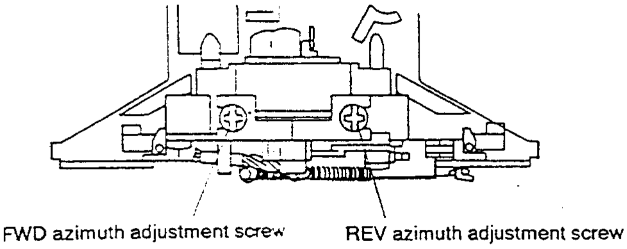
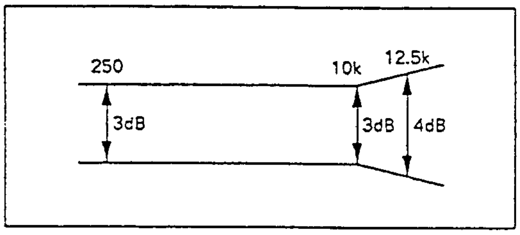

FWD azimuth adjustment screw
REV azimuth adjustment screw

Fig. 7–4 Head azimuth adjustment

PLAY BACK



RECORDING

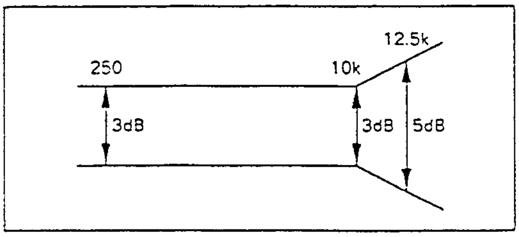


Fig. 7–5 Frequency response zone

PLAYBACK SECTION

1. Head Azimuth Adjustment

- Turn VR103, 104 (Deck I) or VR101, 102 (Deck II) to mechanical center positions.

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	PLAY	Play the 10 kHz/–20 dB section of STD–331E test tape.	Head azimuth adjustment screw. (See Fig. 7–4)	LINE OUT	Maximum playback signal level.	
2.	STOP	Lock the screw with screw lock after completing adjustment.				

2. Playback Level Adjustment

- This adjustment determines the DOLBY NR level, and must be performed with great care.

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	PLAY	Play the 315 Hz/0 dB section of the STD–331E test tape.	Deck I	VR 103 (Lch) VR 104 (Rch)	TP. 1 (Lch) TP. 2 (Rch)	–6.7 dBV	
			Deck II	VR 101 (Lch) VR 102 (Rch)			

RECORDING SECTION

1. Bias Oscillator Adjustment

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC	Load the STD–610 test tape with no input signal.	Deck II	L 452	TP. 11	105 kHz ± 0.3kHz	If the adjustment value on the left cannot be obtained values within 105kHz $\pm^{4}_{0.3}$ kHz are also satisfactory.

2. Recording Bias Adjustment

- After the adjustment, caution should be exercised so as not to become under bias by checking the distortion rate.

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC	Record the 315 Hz and 6.3 kHz signals at –20 dBV input level and playback. (STD-631)	Deck II	VR651(Lch) VR652(Rch)	LINE OUT	Repeatedly record, playback and adjust so that the playback level of 6.3 kHz signal becomes 0.5 dB ± 0.5 dB when compared with the 315 Hz signal.	

3. Recording Level Adjustment

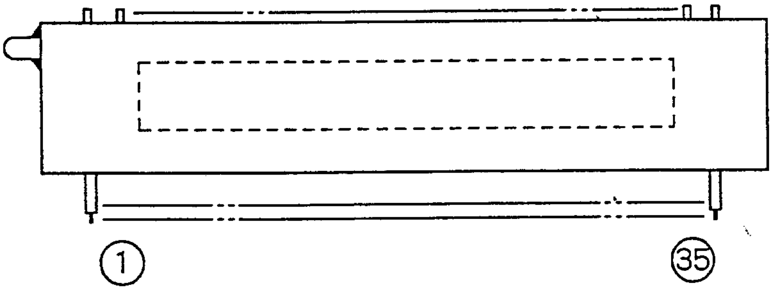
No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	REC PAUSE	Apply a 315 Hz/0 dBV signal to the line input terminals, load the STD–631 test tape.	REC level control volume	TP. 1 (Lch) TP. 2 (Rch)	–11.2 dBV	
2.	STOP	Set the DOLBY NR switch to the ON position.				
3.	REC· PLAY	Record the above signal onto the STD–631 test tape, and playback.	Deck II VR301 (Lch) VR302 (Rch)	TP. 1 (Lch) TP. 2 (Rch)	Repeatedly record, playback and adjust so that the playback signal level becomes – 11.2 dBV.	
4.	REC· PLAY	Record the above signal onto the STD–621 test tape, and playback.	Check	TP. 1 (Lch) TP. 2 (Rch)	–11.2 dBV ± 1.5dB	
5.	REC· PLAY	Record the above signal onto the STD–610 test tape, and playback.	Check	TP. 1 (Lch) TP. 2 (Rch)	–11.2 dBV ± 1.5dB	

4. Level Meter Check

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	REC PAUSE	Apply a 315 Hz/–10 dBV (316 mV) signal to the Line Input terminals.	REC level control volume	TP. 1 (Lch) TP. 2 (Rch)	Check that the level meters "0 dB" light up within -7.2 dBV ± 2 dB of the signal output level.	

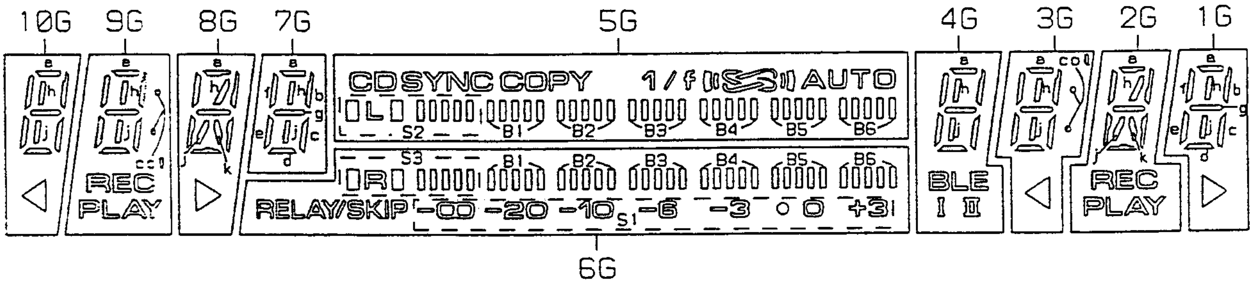
8. FL INFORMATION

- **RAW1123 (V1501)**



PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
CONNECTION	F1	F1	NP	NC	10G	9G	8G	7G	NC	5G	6G	NC	4G	3G	2G	1G	NC	NC	P12	P11	P10	P9	P8	NC	P7	P6	P5	P4	P3	P2	P1	NC	NP	F2	F2

NOTE
1) F1, F2 – – – Filament
2) NP – – – – – No pin
3) NC – – – – – No connection
4) 1G ~ × G – – – Grid
5) DL – – – – – – Datum Line
6) The view angle is 26° at the top and 33° at the bottom (minimum).


10G
9G
8G
7G
5G
4G
3G
2G
1G
6G
a
b
c
d
e
g
h
j
k
col
CD SYNC COPY
1/f
AUTO
S1
S2
S3
B1
B2
B3
B4
B5
B6
REC
PLAY
BLE
I II
RELAY/SKIP
-00
-20
-10
-6
-3
0
+3

ANODE CONNECTION

	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	a	a	a	a	B1	B1	a	a	a	a
P2	b	b	b	b	B2	B2	b	b	b	b
P3	f	f	f	f	B3	B3	f	f	f	f
P4	g	g	g	g	B4	B4	g	g	g	g
P5	c	c	c	c	B5	B5	c	c	c	c
P6	e	e	e	e	B6	B6	e	e	e	e
P7	d	d	d	d	–	CDSYNC	d	d	d	d
P8	h, j	h, j	h, j	h, j	–	COPY	h, j	h, j	h, j	h, j
P9	–	col	k	–	–	AUTO	BLE	col	k	–
P10	◁	PLAY	▷	–	RELAY /SKIP	ᗡD	I	◁	PLAY	▷
P11	–	REC	–	–	S1	1/f	II	–	REC	–
P12	–	–	–	–	S2	S3	–	–	–	–

9. FOR KU, KCXJ, SD AND SL TYPES

CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

CT-W502R/KU, KCXJ, SD, SL and KUXJ have the same construction except for the following:

Mark	Symbol & Description	Part No.					Remarks
		KUXJ type	KU type	KCXJ type	SD type	SL type	
	Main unit	RWZ2823	RWZ2823	RWZ2823	RWZ2849	RWZ2849	
	Display unit	RWZ2825	RWZ2825	RWZ2825	RWZ2850	RWZ2850	
NSP	Transformer 1 unit	RWZ2941	RWZ2941	RWZ2941	RWZ2929	RWZ2929	
NSP	Transformer 2 unit	RWZ2827	RWZ2827	RWZ2827	RWZ2851	RWZ2851	
⚠	Power transformer (AC120V)	RTT1223	RTT1223	RTT1223	......	......	
⚠	Power transformer (AC110/120 – 127/220/240V)	......	......	......	RTT1225	RTT1225	
⚠	AC power cord	PDG1015	PDG1015	PDG1015	PDG1013	PDG1003	
⚠	FU1, FU2 Fuse (UL1.5A)	DEK1014	DEK1014	DEK1014	......	......	
⚠	FU1, FU2 Fuse (T1.6A)	......	......	......	REK1024	REK1024	
⚠	Strain relief	CM – 22C	CM – 22C	CM – 22C	CM – 22B	CM – 22B	
⚠	Line voltage selector (AC110/120 – 127/220/240V)	......	......	......	PSB1002	PSB1002	
NSP	Rear panel	RNA1702	RNA1701	RNA1670	RNA1664	RNA1663	
NSP	Main chassis	RNB1091	RNB1089	RNB1091	RNB1089	RNB1089	
	Packing case	RHG1480	RHG1479	RHG1441	RHG1433	RHG1433	
	Sheet	Z23 – 007	RHX – 034	Z23 – 007	RHX – 034	RHX – 034	
	Operating instructions (English)	RRB1127	RRB1130	......	RRB1129	RRB1129	
	Operating instructions (English/French)	......	......	RRE1071	......	......	
	Operating instructions (Spanish)	......	......	......	RRD1134	......	

MAIN UNIT
RWZ2849 and RWZ2823 have the same construction except for the following:

Mark	Symbol & Description	Part No.		Remarks
		RWZ2823	RWZ2849	
	Q1001	2SB1041	2SA1286	
	C1011	CEAS472M25	RCH1089 (4700 μ /35V)	
	R1002	RS2LMF471J	RS2LMF681J	
	R1020	RFA1/4L470J	RD1/2LF010J	
	R1021 (10 Ω, 1/6W)	......	DCN1002	

DISPLAY UNIT

Although RWZ2850 and RWZ2825 are different in part number, they consist of the same components.

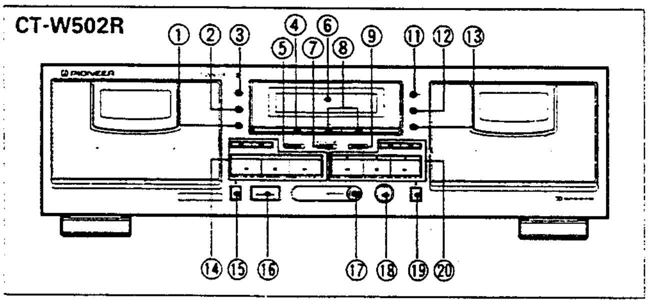
TRANSFORMER 1 UNIT

Although RWZ2929 and RWZ2941 are different in part number, they consist of the same components.

TRANSFORMER 2 UNIT

Although RWZ2851 and RWZ2827 are different in part number, they consist of the same components.

10. PANEL FACILITIES



① **RELAY/SKIP button**

② **DECK I counter reset button (RESET)**

③ **DECK I counter mode button (TIME/COUNT)**

④ **FLEX (1/f) button**

⑤ **Dolby* NR switch (B/OFF/C)**

*
- *Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.*
- *"DOLBY", the double-D symbol DD and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.*

⑥ **Function display**

⑦ **Reverse mode switch (REV MODE)**

Both DECK I and II.

⑧ **Synchro copy buttons (SYNCHRO COPY I▶II)**

NORMAL : Normal speed copy
HIGH : Twice the normal speed copy

⑨ **TIMER mode switch (REC/OFF/PLAY)**

⑪ **DECK II counter mode button (TIME/COUNT)**

⑫ **DECK II counter reset button (RESET)**

⑬ **CD · DECK SYNCHRO recording button (CD SYNC)**

⑭ **Deck I operation buttons**

◀ : Reverse playback
▶ : Forward playback
◀◀/MS : Fast reverse/music search
■ : Stop
▶▶/MS : Fast forward/music search

⑮ **DECK I eject button (⏏)**

- If the tape is moving (recording, playback, tape winding, etc.), press the stop (■) button before pressing this button.

NOTE:

If the power is turned off while the tape is moving, the cassette door may remain locked. In this case, turn the power on before pressing the eject (⏏) button.

⑯ **POWER STANDBY/ON switch**

The POWER switch activates the secondary transformer only. Even when the switch is in the STANDBY position, there will be a power flow to the deck's circuits as long as the power cord is connected to a power outlet.

⑰ **Headphones jack (PHONES)**

⑱ **Recording level control (REC LEVEL)**

⑲ **DECK II eject button (⏏)**

- If the tape is moving (recording, playback, tape winding, etc.), press the stop (■) button before pressing this button.

NOTE:

If the power is turned off while the tape is moving, the cassette door may remain locked. In this case, turn the power on before pressing the eject (⏏) button.

⑳ **DECK II operation buttons**

◀ : Reverse playback
▶ : Forward playback
◀◀/MS : Fast reverse/music search
■ : Stop
▶▶/MS : Fast forward/music search
O : Recording mute
II : Pause
● : Recording

11. SPECIFICATIONS

System	4-track, 2-channel stereo
Heads	"Hard Permalloy" recording/playback head × 1 "Hard Permalloy" playback head × 1 "Ferrite" erasing head × 1
Motor	DC servo motor × 2
Wow and Flutter	No more than 0.1% (WRMS)
Fast Winding Time	Approximately 120 seconds (C-60 tape)
Frequency Response	
−20 dB recording:	
TYPE IV (Metal) tape	25 to 16,500 Hz
TYPE II (High/CrO_2) tape	25 to 16,000 Hz
TYPE I (Normal) tape	25 to 16,000 Hz
Signal-to-Noise Ratio	
Dolby NR OFF	More than 57 dB
Noise Reduction Effect	
Dolby B-type NR ON	More than 10 dB (at 5 kHz)
Dolby C-type NR ON	More than 19 dB (at 5 kHz)
Harmonic Distortion	No more than 0.8% (at −4 dB: 160 nwb/m)
Input (Sensitivity)	
LINE (INPUT)	100 mV (Input impedance 68 kΩ)
Output (Reference level)	
LINE (OUTPUT)	0.5 V (Output impedance 3.2 kΩ)
Headphones	0.63 mW (Load impedance 8 Ω)

Subfunctions

- Automatic reverse
- DOLBY HX PRO recording function
- DOLBY B/C type NR
- Music search over ±15 selections
- Synchronized copy start
- High-speed and normal-speed copy (Deck I → Deck II)
- Relay playback/blank skip
- CD · DECK SYNCHRO recording capability
- Peak level meter with peak-hold function
- Automatic space recording mute
- Automatic tape selector
- SR System remote control available
- TIMER Recording
- TIMER Playback (Automatic relay on)
- 2-mode electronic 4-digit twin tape counter
- Headphone jack
- FLEX system

Miscellaneous

Power Requirements	AC 110/120 – 127/220/240V (switchable), 50/60 Hz
Power Consumption	16 W
Dimensions	420(W) x 120(H) x 250(D) mm
Weight (without package)	4.2 kg

Accessories

Operating instructions	1
Connection cord with pin plugs	2
SR Remote control cord	1
CD · DECK SYNCHRO control cord	1

NOTE:
Specifications and design subject to possible modifications without notice, due to improvements.